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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,466	10/15/2003	Hyuk Chang	249/248 DIV	4693

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EXAMINER	
MERCADO, JULIAN A	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 11/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/684,466	CHANG, HYUK	
	Examiner	Art Unit	
	Julian Mercado	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2006*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-30* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *17-30* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Remarks

This Office action is responsive to applicant's amendment filed September 6, 2006.

Claims 17-30 are pending.

This Office action is made NON-FINAL.

Claim Rejections - 35 USC § 112

The rejection of claims 17-30 under 35 U.S.C. 112, second paragraph has been withdrawn.

Claim Rejections - 35 USC § 102 and 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17, 18 and 20-23 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over applicant's admitted prior art (Wilson , U.S. Pat. 5,234,777).

The rejection is maintained for the reasons of record. The examiner notes that the pending claims are as previously presented and no amendments have been made at this time. The examiner's response to each of applicant's salient arguments here follows.

The examiner acknowledges applicant's identification of Figures 2A and 2B as being derived from Wilson (U.S. Pat. 5,234,777). In reference to Wilson, applicant submits "that the catalyst-and-carbon particles contact surface that lies at an interface, or contact area, *between* a proton exchange membrane *and* a catalytic layer, is very small." (page 7, emphasis as submitted) The metes and bounds, much less the dimensions, of a "very small" contact surface are not understood. Notwithstanding, applicant is reminded that attorney arguments are not evidence and cannot take place of evidence in the record; an assertion of what seems to follow from mere observation, e.g. the characterization that something is "very small," is just attorney argument and not the kind of factual evidence that is required to rebut a prima facie case of obviousness. MPEP 2145. If applicant's argument is premised on the dimensions of the claimed *nanophase* catalyst layer, to what extent this size dimension may differentiate from the prior art is not understood; it is asserted that the carbon and catalyst particles of the prior art are indeed nano-sized, at 2-5 nm and 100 nm, respectively. Refer to the prior Office action on page 3. Thus, contrary to applicant's assertion, there is no significant structural distinction, or *any* structural distinction at all, between the prior art and the claimed membrane-electrode assembly.

In response to applicant's characterization of the rejection of each of the dependent claims being a single blanket statement, as to claims 18 and 20 Wilson's catalyst is Pt with a loading of 0.20 mg/cm^2. See col. 7 line 26 et seq. As to claim 21, the weight percent of the catalytic metal is 20 wt. %. See col. 4 line 34. Pertaining to claims 22 and 23, as to the claimed coating by sputtering or arc discharging and the bonding steps, these process limitations have not given patentable weight as the limitations do not give breadth or scope to the product claim. The claimed product appears to be the same or similar to the prior art product insofar as being a membrane electrode assembly having nano-sized catalyst and carbon particles. In the event that any differences can be shown by the product of the product-by-process claims, such differences would have been obvious to the skilled artisan as a routine modification of the product absent of a showing of unexpected results. _In re Thorpe_, 227 USPQ 964 (Fed. Cir. 1985).

Applicant submits that the examiner has failed to demonstrate how the separate preparation of the catalytic film as described in Wilson would result in the same structure as that obtained by the process recited in claim 17. As to the Wilson reference forming a separate catalyst layer, is not applicant's claimed invention, in reciting a first step of "coating catalytic metal particles..." and a second step of "coating carbon particles..." also a recitation in separate steps? To what extent a separate step in Wilson is (somehow) distinct from applicant's claimed product-by-process claims is not clear. Notwithstanding, it is asserted that in Wilson both the catalyst particles [24] and the carbon particles [25] are indeed coated on the membrane, "a high volume density of supported catalyst 24 with the ionomer 28 in the interstices", i.e. "a supported platinum (Pt) catalyst layer 24 uniformly dispersed in ionomer 28 to assure that a uniform and controlled depth of the catalyst is maintained" and "the supporting carbon particles 25 are in contact with adjacent particles to form a low contact resistance electronic path through catalyst layer 22." See col. 4 line 7 et seq. and line 29 et seq. It is asserted that the structure in Wilson is indeed the same as that claimed as the carbon and catalyst particles are nano-sized having dimensions of 2-5 nm and 100 nm, respectively.

(new rejection)

Claims 17- are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Dearnaley et al. (U.S. Pat. 6,153,327).

For independent claims 17 and 24, Dearnaley et al. teaches a fuel cell membrane electrode assembly, in which the membrane is coated with both catalytic metal particles and carbon particles, then bonded together. See col. 4 lines 4-15 and line 37 et seq.

For claims 18 and 25, the metal may be Pt, *inter alia*. See col. 4 line 1 et seq.

For claims 19 ad 26, the catalyst layer thickness is 100 angstrom, which is equal to 10 nm. See col. 6 line 27. As to the particle size of carbon and catalytic metal, the former is specifically disclosed as a nanophase and are deposited at the *atomic* scale (angstrom level). See col. 6 line 5 et seq.

For claims 20 and 27, the catalyst loading is at 0.01 to about 0.1 mg/cm^{2}. See col. 6 lines 14-15.

For claims 21 and 28, the amount of catalytic metal is from 15 to 75 atomic %. Since atomic percent is a ratio measurement based on volume and given that both particles are of the same order of magnitude (nanophase), the atomic % range is reasonably construed to comfortably overlap with the claimed weight percent range.

As to the claimed coating by sputtering, simultaneous sputtering, arc discharging and the bonding steps as recited in independent claims 17 and 24 as well as dependent claims 22, 23, 29 and 30, these process limitations have not given patentable weight as the limitations do not give breadth or scope to the product claim. The claimed product appears to be the same or similar to the prior art product insofar as being a membrane electrode assembly having nano-sized catalyst and carbon particles. In the event that any differences can be shown by the product of the product-by-process claims, such differences would have been obvious to the skilled artisan as a routine modification of the product absent of a showing of unexpected results. *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985).

Furthermore, to the extent that the present arguments may be applicable towards Dearnaley et al. insofar as the claimed invention is in some manner not separately prepared, it is asserted that in Dearnaley et al. the coating of the catalyst and carbon is performed *simultaneously*. See col. 5 line 38 et seq.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

jam

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER